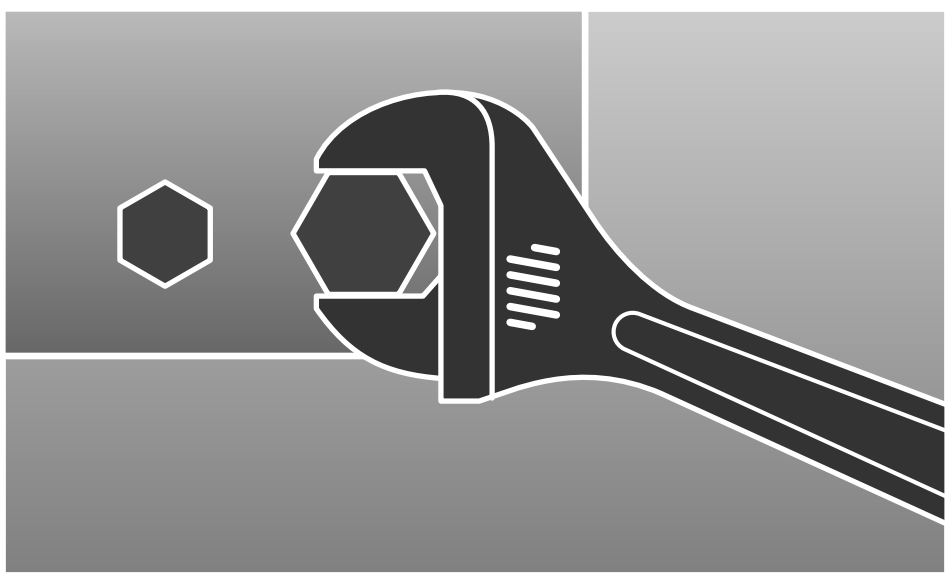
SAMSUNG

INSTALLATION MANUAL

FH18BTA1
FH18ETA1
FH24BTA1
FH24ETA1
FC18BTVA
FC18ETVA
FC24BTVA
FC24ETVA

System Air Conditioner (Cooling and Heating)



ⒺⒶDB98-27860A(2)

Safety Precautions

The following safety precautions must be taken when using your air conditioner.

⚠ WARNING

Risk of electric shock. • Can cause injury or death. • Disconnect all remote electric power supplies before servicing, installing or cleaning. • This must be done by the manufacturer or its service agent or a similar qualified person in order to avoid a hazard.

INSTALLING THE UNIT

- The unit should not be installed by the user. Ask the dealer or authorized company to install the units except room air conditioners for the U.S.A and Canada area.
- If the unit is installed improperly, water leakage, electric shock or fire may result.
- Mount with the lowest moving parts at least 2.5 m above the floor or grade level. (If applicable)
- The manufacturer does not assume responsibility for accidents or injury caused by an incorrectly installed air conditioner. If you are unsure about installation, contact an installation specialist.
- When installing the built-in type air conditioner, keep all electrical cables such as the power cable and the connection cord in pipe, ducts, cable channels e.t.c to protect them against liquids, outside impacts and so on.

POWER SUPPLY LINE, FUSE OR CIRCUIT BREAKER

- If the power cord of this air conditioner is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The unit must be plugged into an independent circuit if applicable or connect the power cable to the auxiliary circuit breaker. An all pole disconnection from the power supply must be incorporated in the fixed wiring with a contact opening of >3mm.
- Do not use an extension cord with this product.
- If the unit is equipped with a power supply cord and a plug, the plug must be accessible after installation.
- The air conditioner must be installed in accordance with national wiring regulations and safety regulations wherever applicable.

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Preparation for installation

When deciding on the location of the air conditioner with the owner, the following restrictions must be taken into account.

General

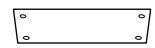
Do NOT install the air conditioner in a location where it will come into contact with the following elements:

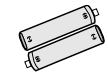
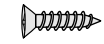
- Combustible gases
- Saline air
- Machine oil
- Sulphide gas
- Special environmental conditions

If you must install the unit in such conditions, first consult your dealer.

Accessories

- The following accessories are supplied with the indoor unit.
- The type and quantities may differ depending on a specification.

Pattern sheet 	Owner's Instructions	Installation Manual
Plate Hanger	Cable-Tie	

Wireless Remote Controller	Remote Controller Holder	Battery 	M4 X 12 Tapped Screw 

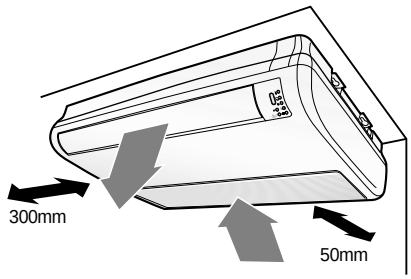
Deciding on where to install the indoor unit

Indoor Unit

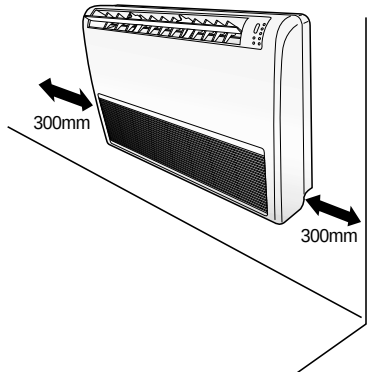
- Select a convenient location that permits the air to reach every corner of the area to be cooled.
- Pre-plan for easy and short routing of the refrigerant tubing and wiring to the outdoor unit.
- There should be no flammable gas, alkaline, substances present in the air.
- Avoid location where obstacles preventing good air circulation are present.
- Noise prevention should be considered in determining the unit's location.
- The structure, where the unit is to be installed should be strong enough to support the weight of the unit.
- Do not install the unit where it will be exposed to direct sunlight.

Space Requirements for Indoor Unit

Ceiling installation

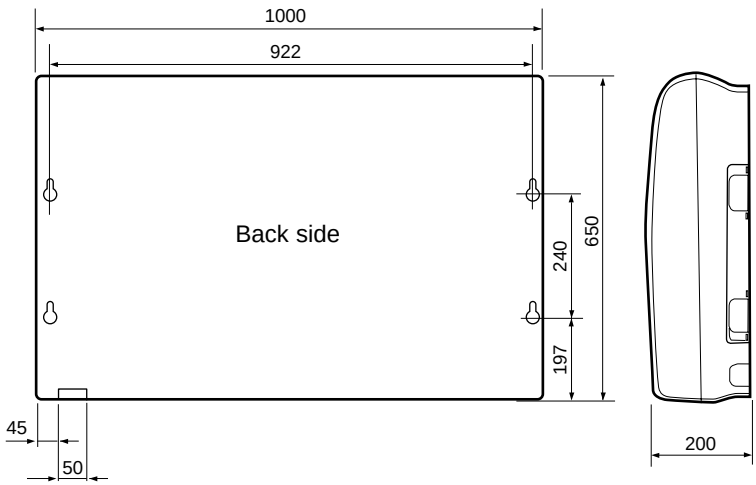


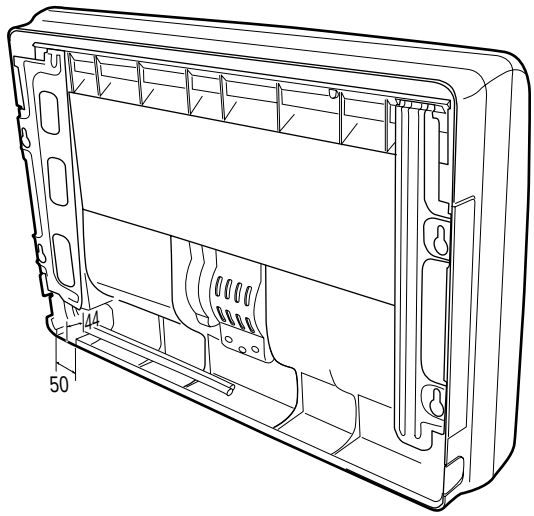
Floor installation

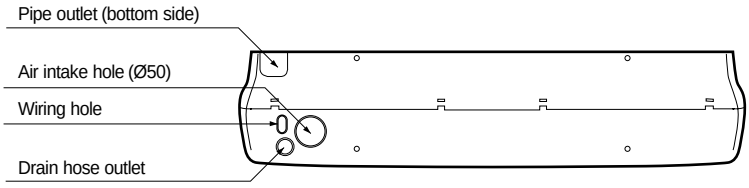


Drawing of the indoor unit

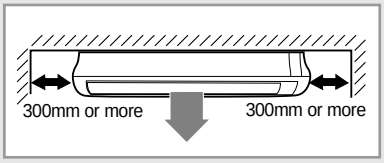
Unit : mm




44
50

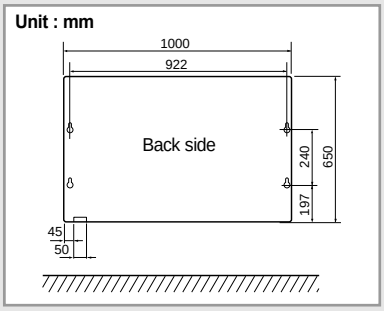

Pipe outlet (bottom side)
Air intake hole (Ø50)
Wiring hole
Drain hose outlet

Ceiling installation



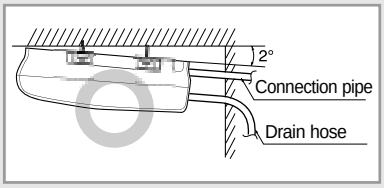
1 Select pipe directions.
When the directions are selected, drill 3-1/8" (100mm, for pipe and cables) and 1-3/4" (40mm, for drain hose) diameter holes on the wall so that it slants slightly downwards toward the outdoor for smooth water flow.

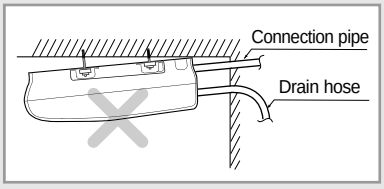
Note ◆ Use the pattern sheet to select pipe directions.



2 Drill holes for anchor bolts according to the distance and mount them.

Note ◆ Use the pattern sheet.

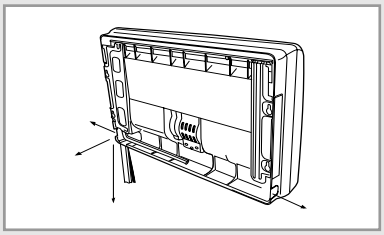




3 Install the unit onto the ceiling. Be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.

Note ◆ For proper drainage of condensate, give a 2° slant to the side of the unit which will be connected with the drain hose as shown in the figure.

IMPORTANT **Ensure that the ceiling is strong enough to support the weight of the indoor unit. Before hanging the unit, test the strength of each attached suspension bolt.**

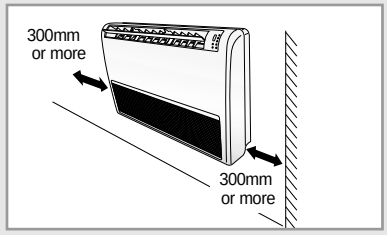


4 If installing on dropped ceiling, install threaded rod onto anchor bolt (expansion bolt) to long enough to suspend the unit right below the dropped ceiling and the install the unit suspending on the threaded rod.

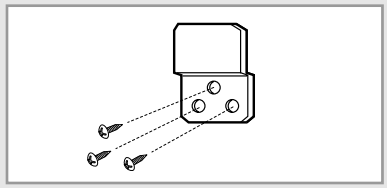
Floor installation

1 Select pipe directions.
When the directions are selected, drill 3-1/8" (100mm, for pipe and cables) and 1-3/4" (40mm, for drain hose) diameter holes on the wall so that it slants slightly downwards toward the outdoor for smooth water flow.

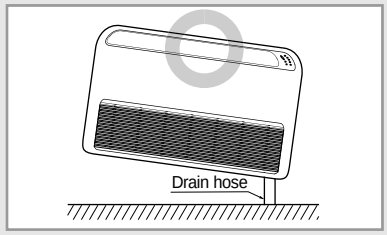
Note ◆ Use the pattern sheet to select pipe directions.

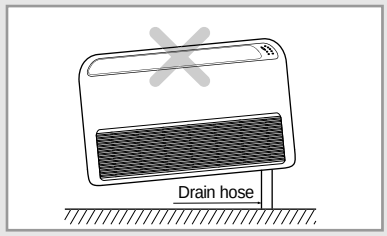


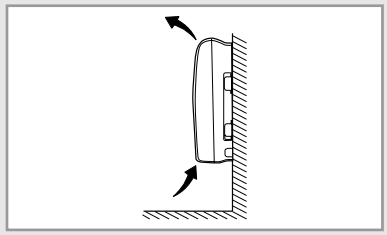
2 Install the hanging plate according to the distance and mount it.

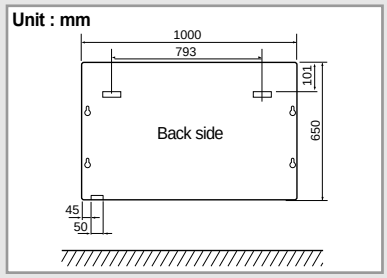


3 Install the unit and be sure to arrange the drain hose so that it is leveled lower than the drain hose connecting port of the indoor unit.



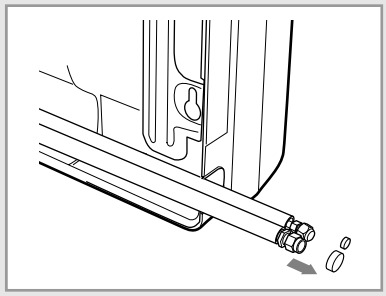






Purging the unit

On delivery, the indoor unit is loaded with an inert nitrogen gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as follows.



Unscrew the caps at the end of each pipe.

Result: All inert gas escapes from the indoor unit.

Note

- To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.

Connecting the refrigerant pipe

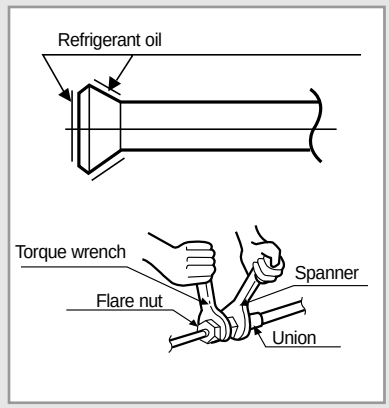
There are two refrigerant pipes of differing diameters:

- A smaller one for the liquid refrigerant
- A larger one for the gas refrigerant
- The inside of copper pipe must be clean & has no dust.

1 Remove the pinch pipe on the pipes and connect the assembly pipes to each pipe, tightening the nuts, first manually and then with a torque wrench, a spanner applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	140~170
9.52 mm (3/8")	250~280
12.70 mm (1/2")	380~420
15.88 mm (5/8")	440~480
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

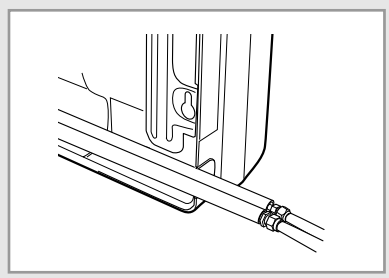
Note ◆ If the pipes must be shortened refer to page 12.



2 Must use insulator which is thick enough to cover the refrigerant pipe to protect the condensate water on the outside of pipe falling onto the floor and the efficiency of the unit will be better.

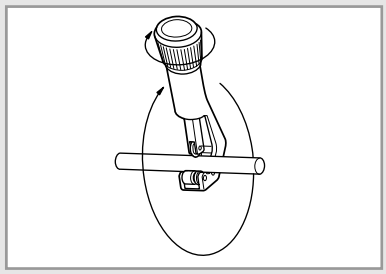
3 Cut off any excess foam insulation.

4 Be sure that there must be no crack or wave on the bended area.



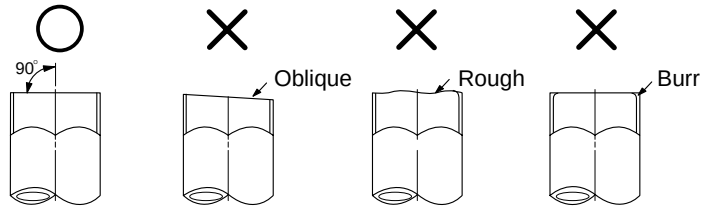
5 It would be necessary to double the insulation thickness(10mm or more) to prevent condensation even on the insulator when if the installed area is warm and humid.

Cutting / Flaring the pipes

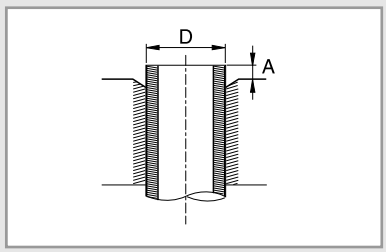


1 Make sure that you have the required tools available (pipe cutter, reamer, flaring tool and pipe holder).

2 If you wish to shorten the pipes, cut it with a pipe cutter, taking care to ensure that the cut edge remains at a 90° angle with the side of the pipe. Refer to the illustrations below for examples of edges cut correctly and incorrectly.



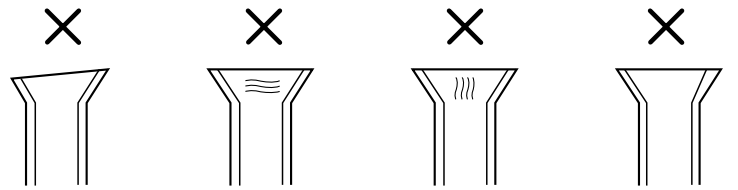
3 To prevent any gas from leaking out, remove all burrs at the cut edge of the pipe, using a reamer.

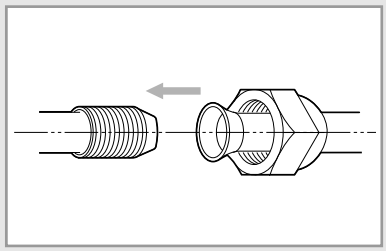


4 Slide a flare nut on to the pipe and modify the flare.

Outer Diameter (D)	Depth (A)
6.35 mm (1/4")	1.3mm
9.52 mm (3/8")	1.8mm
12.70 mm (1/2")	2.0mm
15.88 mm (5/8")	2.2mm
19.05 mm (3/4")	2.2mm
22.23 mm (7/8")	2.2mm

5 Check that the flaring is correct, referring to the illustrations below for examples of incorrect flaring.





6 Align the pipes and tighten the flare nuts first manually and then with a torque wrench, applying the following torque.

Outer Diameter	Torque (kgf•cm)
6.35 mm (1/4")	140~170
9.52 mm (3/8")	250~280
12.70 mm (1/2")	380~420
15.88 mm (5/8")	440~480
19.05 mm (3/4")	990~1210
22.23 mm (7/8")	990~1210

CAUTION

- ***In case of welding the pipe, you must weld with nitrogen gas blowing.***

Performing leak test & insulation

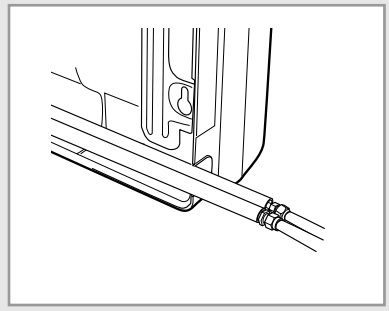
Leak Test

Before completing the installation (insulation of the hose and pipe), you must check that there are no gas leaks.

1 After closing both high and low stop valve of the outdoor unit, inject nitrogen gas into refrigerant pipe.

2 By using soap bubbles, check leak on flare nut connection of pipes.

3 Purge nitrogen gas after finishing leak test.

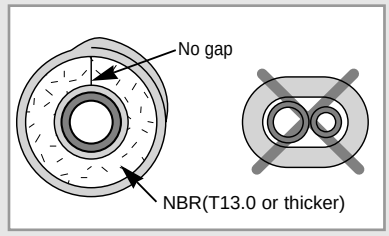


Insulation

Once you have checked that there are no leaks in the system, you can insulate the piping and hose.

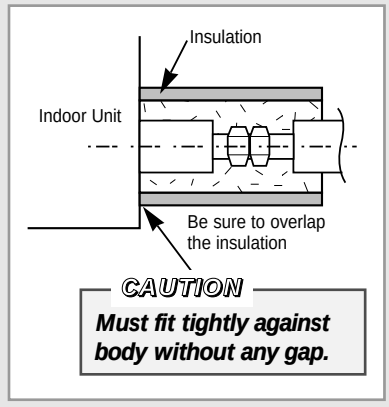
1 To avoid condensation problems, place **T13.0 or thicker Acrylonitrile Butadien Rubber** separately around each refrigerant pipe.

Note ◆ Always make the seam of pipes face upwards.



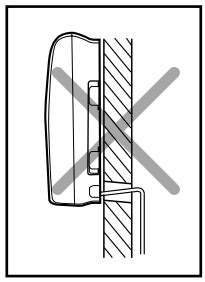
2 Wind insulating tape around the pipes.

3 Finish wrapping insulating tape around the rest of the pipes leading to the outdoor unit.

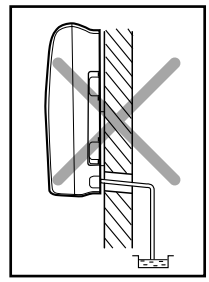


Drain hose installation

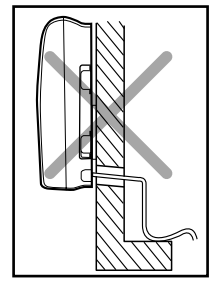
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensation water is correctly drained outside. When passing the drain hose through the hole drilled in the wall, check that none of the following situations occur.



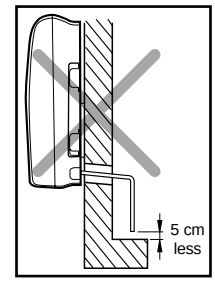
The hose must NOT slope upwards.



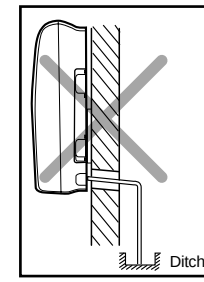
The end of the drain hose must NOT be placed in water.



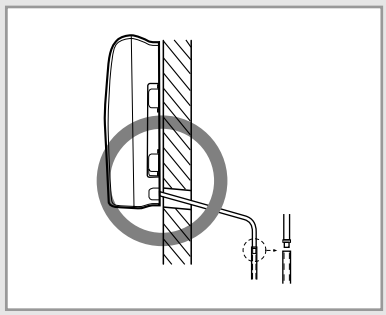
Do NOT bend the hose in different directions.



Keep a clearance of at least 5 cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.



If draining pipe is not too long.

It may be extended the draining pipe by connecting as following figure.

Connecting the connection cord

The indoor unit is powered from the outdoor unit via the connection cord.

1 Remove the screw on the electrical component box and remove the cover plate.

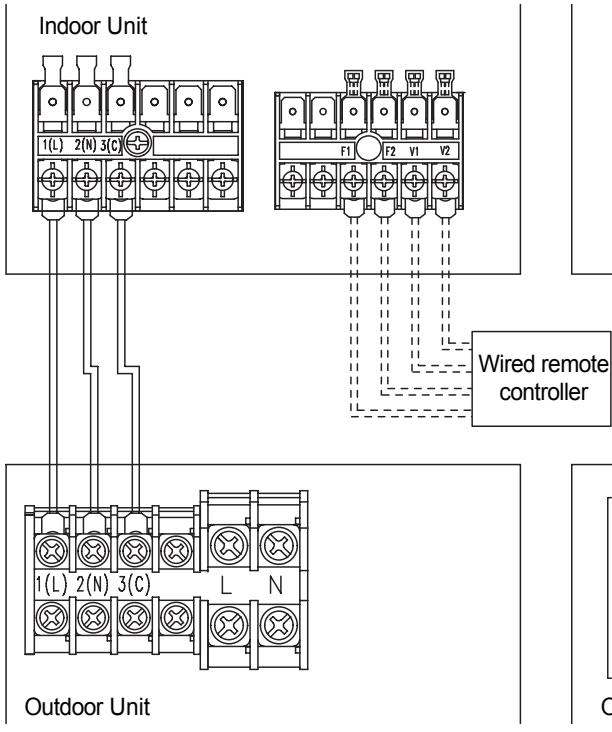
2 Route the connection cord through the side of the indoor unit and connect the cable to terminals; refer to the figure below.

3 Route the other end of the cable to the outdoor unit through the ceiling & the hole on the wall.

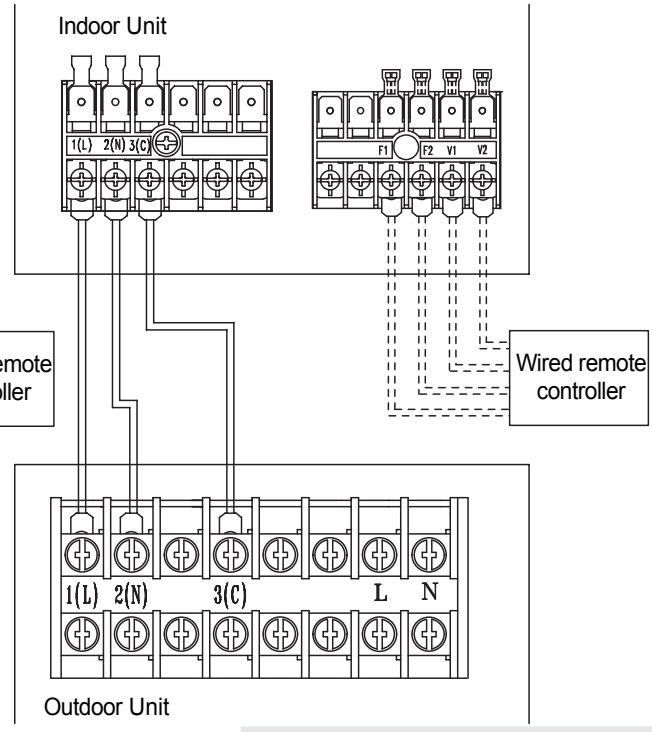
4 Reassemble the electrical component box cover, carefully tightening the screw.

Wiring Diagram

◆ **FC24**✳✳✳✳



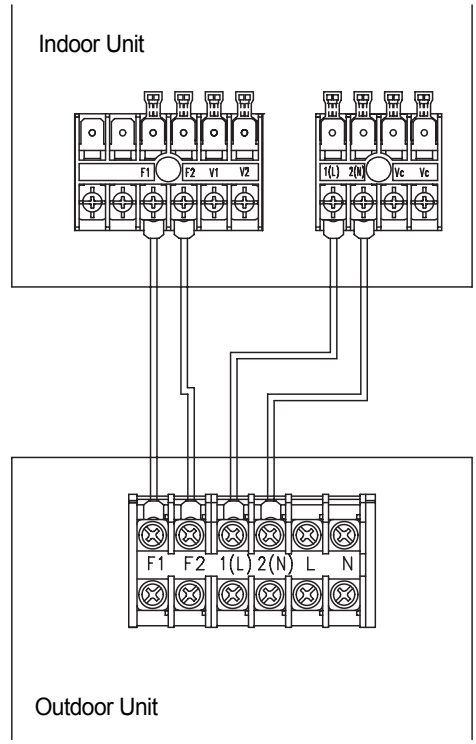
◆ **FC18**✳✳✳✳



Connecting the connection cord(Cont.)

Wiring Diagram

◆ FH24/18✳✳✳✳



Power cable specification

Single Phase (FH✳✳✳✳✳✳)						
Power supply	**Max/Min(V)**	**MCCB**	**ELB**	**Power cable**	**Length**	**Earth cable**
220V~/60HZ	242/198	Frame: 30A	25A	2.0mm^2,2wires	10m or less	Ø 1.6mm,1 wire
220-240V~/50HZ	264/198	Trip: 25A		2.0mm^2,2wires	10m or less	

Single Phase (FC✳✳✳✳✳✳)						
Power supply	**Max/Min(V)**	**MCCB**	**ELB**	**Power cable**	**Length**	**Earth cable**
220V~/60HZ	242/198	Frame: 30A	25A	2.0mm^2,3wires	10m or less	Ø 1.6mm,1 wire
220-240V~/50HZ	264/198	Trip: 25A		2.0mm^2,3wires	10m or less	

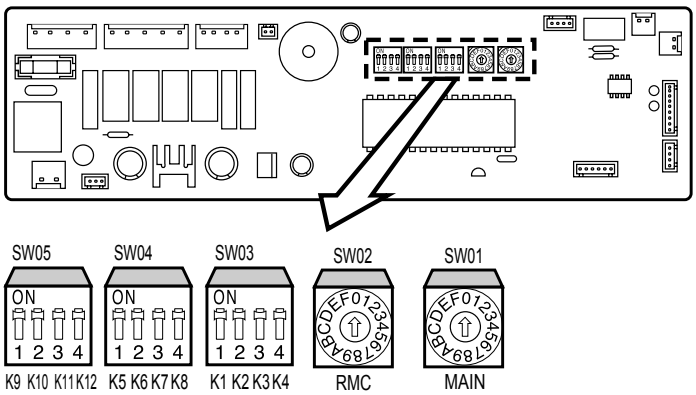
✳ *The power cable is not supplied with air conditioner .*

✳ *For power cable , use the grade H07RN-F or H05RN-F materials .*

Assigning address to indoor unit

1 Before installing the indoor unit, assign an address to the indoor unit according to the air conditioning system plan.

2 The address of the indoor unit is assigned by adjusting MAIN(SW02) and RMC(SW01) rotary switches.



3 The MAIN address is for communication between the indoor unit and the outdoor unit. Therefore, you must set it to operate the air conditioner properly.

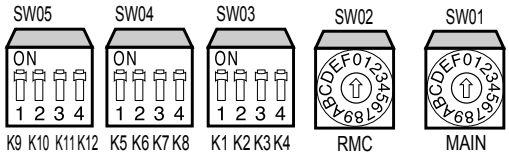
4 It is required to set the RMC address if you install the wired remote controller or the centralized controller.

5 If you install optional accessories such as the wired remote controller, centralized controller, etc. see an appropriate installation manual.

6 If an optional accessory is not installed, you do not have to set the RMC address. However, adjust K1 and K2 switches of the SW03 DIP switch to "ON" position in this case.

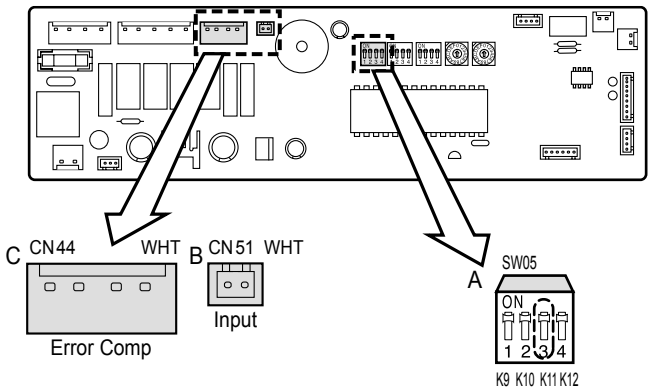
7 Set the MAIN address by adjusting the rotary switch(SW02) from 0 to F. Each indoor unit connected to the same outdoor unit must have different address.

i. e. If an indoor unit does not have an optional accessory
and its MAIN address is "0"



Using external control function (Option)

On/Off control by inputting external signal



A. Switch for setting external control function

- ◆ K11 : ON(The external control function is not used)
  OFF(The external control function is used)
- ◆ The 'external control input port' or 'external control output port' is used depending on the setting.

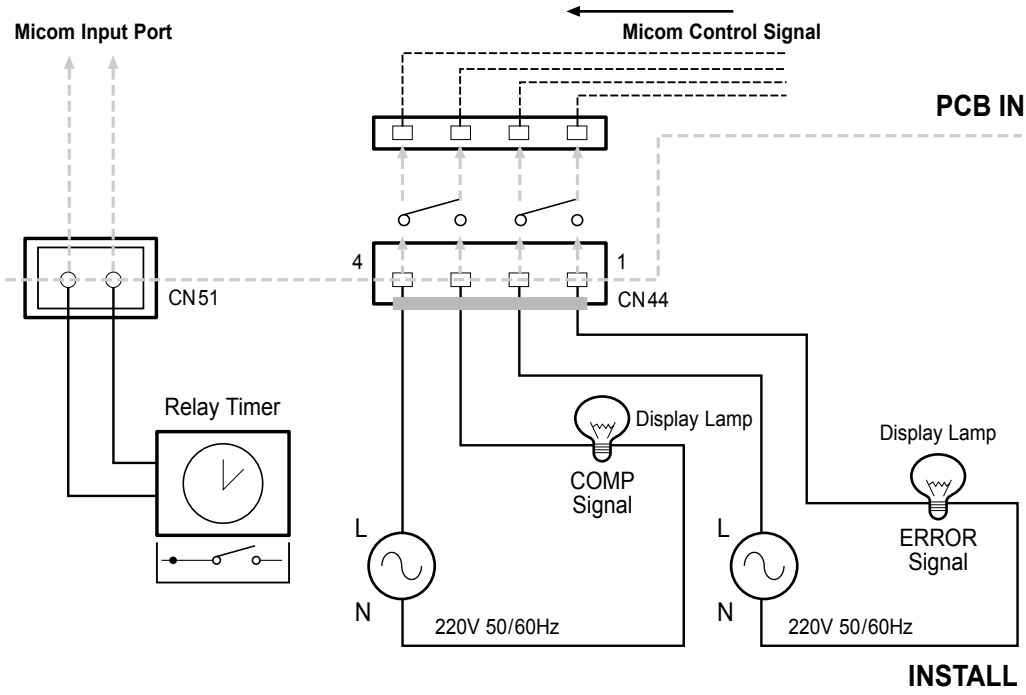
B. External control input port(CN51)

- ◆ It turns on or off the indoor unit using the External Relay Timer or Relay Switch.
- ◆ Specifications of the external input signal
  - Input signal : Relay Timer
  - Debounce Time : 100ms or more
  - Function : The indoor unit turns on or off by the external Timer signal. The air conditioner starts up in the mode selected when the unit was last used. (DCS mode included)

C. External control output port(CN44)

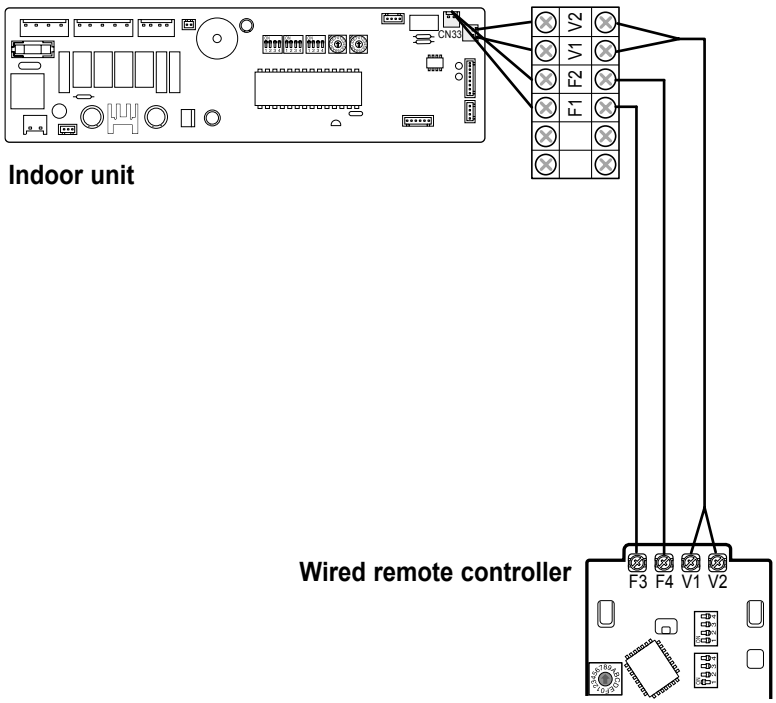
- ◆ It outputs the operation state of the outdoor unit compressor and error when the external control function is in use.
- ◆ Specifications of the external input signal
  - Voltage range : maximum 30V DC, 250V AC
  - Current range : maximum 3A

System diagram of external control



Installing the wired remote controller(Option)

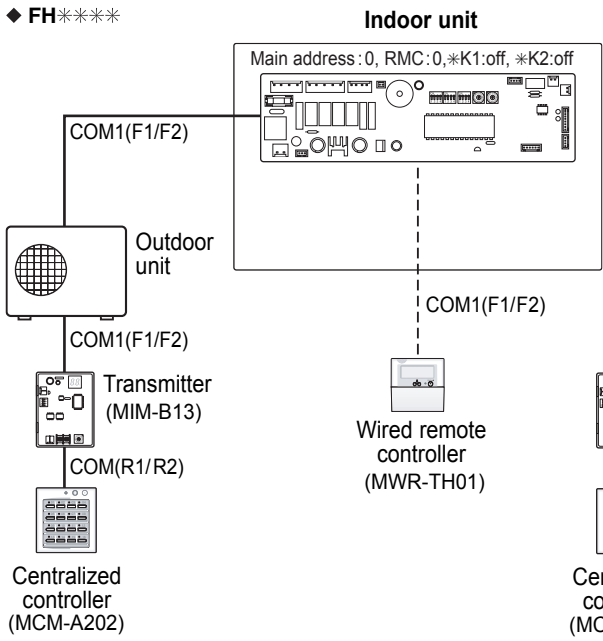
Connection diagram



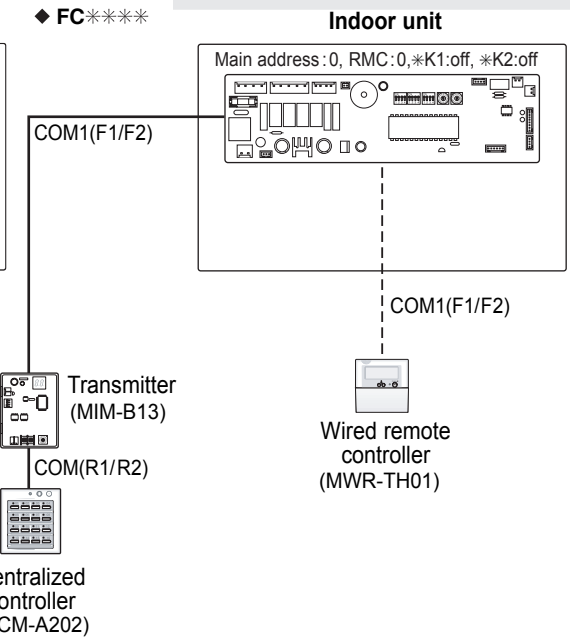
Examples of installing wired remote controller

Individual control : Controlling 1 indoor unit with 1 wired remote controller

◆ **FH**✳✳✳✳

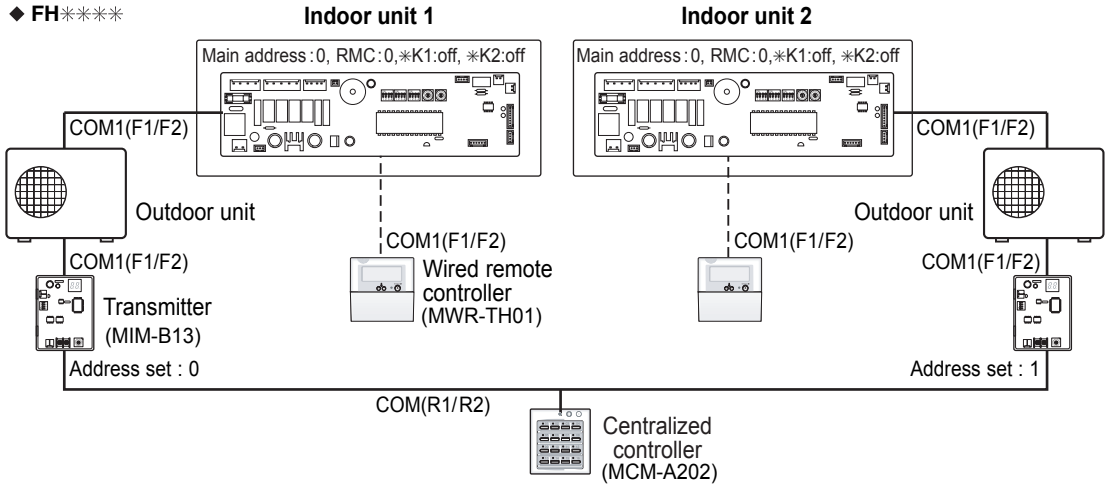


◆ **FC**✳✳✳✳

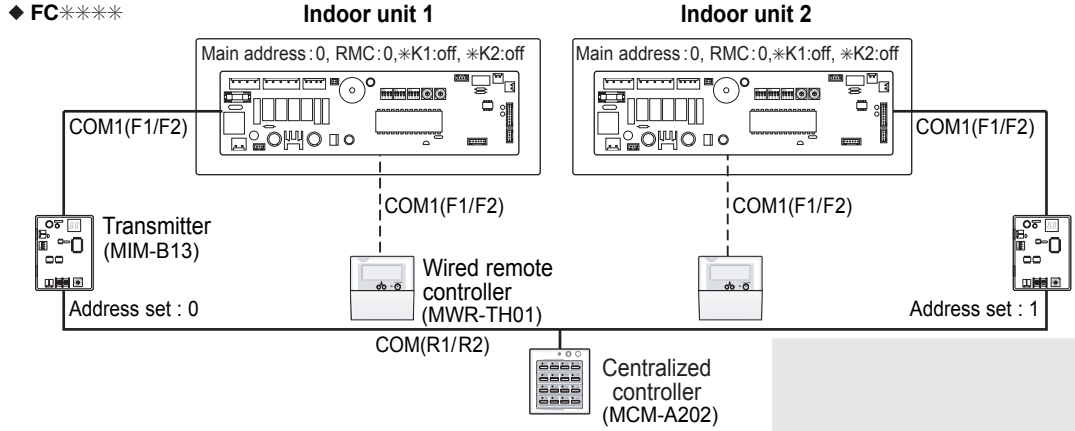


Group control : Controlling 2 indoor units with 2 wired remote controller

◆ **FH**✳✳✳✳



◆ **FC**✳✳✳✳



Detection of errors FH24BTA1/FH18BTA1/FH24ETA1/FH18ETA1

- If an error occurs during the operation, an LED flickers and the operation is stopped except the LED.
- If you re-operate the air conditioner, it operates normally at first, then detect an error again.

LED Display on the indoor unit

LED Display

Error mode	LED lamp						Remark
	Auto						
Power Reset	X	◑	X	X	X	X	
Error of the indoor unit sensor	X	X	◑	X	X	X	Displayed on appropriate indoor unit which is operating
Error of the indoor unit pipe sensor	X	◑	◑	X	X	X	Displayed on appropriate indoor unit which is operating
Error of the outdoor unit pipe sensor (FH✳✳✳✳)	X	◑	X	◑	X	X	Displayed on appropriate indoor unit which is operating Displayed on outdoor unit
Communication error (Transmitter, wired remote control) (FH✳✳✳✳)	X	X	◑	◑	X	X	Error of indoor unit: Displayed on the indoor unit regardless of operation
Communication error between indoor units (FH✳✳✳✳)	X	◑	X	X	◑	X	Error of outdoor unit: Displayed on the indoor unit which is operating
Freeze prevention control (Errors occur during 6th detection) (FH✳✳✳✳)	X	X	◑	◑	◑	X	
Error of peripherals option set-up (FH✳✳✳✳)	X	X	◑	X	◑	X	
EEPROM error	X	◑	◑	◑	X	X	
EEPROM option error	◑	◑	◑	◑	◑	◑	

◑ Flickering X Off

- If you turn off the air conditioner when the LED is flickering, the LED is also turned off.
- If you re-operate the air conditioner, it operates normally at first, then detects an error again.

Wired remote controller

◆ If an error occurs, TEST is displayed on the wired remote controller.
If you would like to see an error code, press the Test button.

Display	Explanation	Remark
416	Compressor down due to protection control of the discharge temperature sensor	Error about protection control of the outdoor unit (FH✳✳✳✳✳✳)
450	Control due to the condenser temperature sensor when cooling mode	
451	Error of the low pressure switch (Protection control)	
425	Reverse phase error (Protection control)	
551	In removing frost	
221	Error of the outdoor temperature sensor (Open/Short)	Error about the outdoor unit sensor (Open/Short) Detection during the operation of the indoor unit (sensing and sending errors into the communication data) (FH✳✳✳✳✳✳)
237	Error of condensor temperature sensor (Open/Short)	
251	Error of discharge temperature sensor (Open/Short)	
201	- System down caused by communication error after completion of tracking - Mismatching of the indoor unit numbers set with those communication after completion of 5 times tracking	Communication and the indoor unit errors
121	Error of temperature sensor in the indoor unit (Open/Short)	Self-diagnosis of the indoor and outdoor unit
122	Error of the heat exchanger sensor in the indoor unit (Open/Short)	
419	Error of electronic expansion valve open in the outdoor unit (when it is detected more than once) (FH✳✳✳✳✳✳)	
422	Error of electronic expansion valve close in the outdoor unit (when it is detected more than once) (FH✳✳✳✳✳✳)	
601	Error of communication between the indoor unit and the wired remote controller	Wired remote controller errors
602	Master wired remote controller ↔ Slave wired remote controller	
606	COM1/COM2 Cross-installed error	
CEA	Error of setting option for wired remote controller COM2	

Optional parts list

Wired Remote Controller Accessories

Wired remote controller (MWR-TH01)	Cable-tie	Cable clamp	M4x16 tapped screw	Indoor unit power drawing cable
1	2	5	7	1

Communication cable of the wired remote controller	Wire joint	Owner's instructions	Installation manual
1	1	1	1

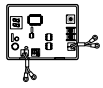
Centralized Controller Accessories

Centralized controller (MCM-A202)	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	5	7	1	1

Function Controller Accessories

Function controller (MCM-A100)	Cable-tie	Cable clamp	M4x16 tapped screw	Owner's instructions	Installation manual
1	2	6	7	1	1

Transmitter Accessories

Transmitter (MIM-B13)	Transmitter power cable	Transmitter communication cable	Installation manual
1	1	1	1
			

Note ◆ If you would like to install the centralized controller, you must install the transmitter in the outdoor unit.

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